

The graph shows (1) the relative deaths, as above defined, on the day on which a given temperature occurs, and (2) on the second day thereafter.

We should, perhaps, eliminate the findings for the temperatures less than 10° and over 85° because of the small number of days involved. But, beginning with days whose mean daily temperature was 11°, the table (column 0) indicates that (1) the highest death rates occur on the colder days; (2) the excess mortality declines up to a temperature of about 60°; (3) the most favorable mortality is on those days when the temperature averages between 60° and 75°; and (4) there is a very rapid increase in mortality with increasing temperature beyond 75°.

Everyday observation and the table below suggest that cold weather does not exercise its maximum effect on the same day, but that such effect is deferred for several days. In this series the most pronounced effect of cold temperatures seems to occur two days afterward. The unfavorable effect of cold weather lasts, however, for many days after its occurrence. But this condition is evidently connected with the fact that cold weather persists for several days at a time and the effect of such persistence may be cumulative on the death rate. This point requires further study. On the other hand, as might be expected, the effect of warmer temperatures is most pronounced on the same day, continuing only for one or two days thereafter.

*Daily mortality in New York City, 1883-1888, among persons 5 years of age and over.*

Mean daily temperature.	Number of days. <sup>1</sup>	Mortality in per cent of daily average for year in which temperature occurred.						
		Same day.	Days after.					
			0	1	2	3	4	5
Under 5°	5	97.5	99.4	111.9	105.6	111.4	108.8	104.9
6°-10°	15	99.3	104.9	110.9	115.9	114.9	105.3	104.6
11°-15°	39	103.5	111.4	110.2	108.9	109.3	109.1	106.7
16°-20°	71	106.7	104.9	109.1	108.2	112.8	109.6	108.6
21°-25°	89	104.9	106.5	108.8	109.1	107.2	108.4	107.2
26°-30°	130	103.2	104.3	105.3	104.7	108.7	108.1	107.5
31°-35°	181	106.5	107.0	106.3	108.4	107.0	106.0	107.0
36°-40°	189	103.9	103.3	105.3	105.3	104.2	104.4	105.8
41°-45°	154	107.5	108.1	108.8	108.7	107.5	107.7	107.6
46°-50°	153	101.6	103.9	104.0	103.5	102.3	102.8	100.7
51°-55°	151	101.6	103.5	102.1	100.7	100.7	101.1	101.4
56°-60°	170	100.7	97.2	97.4	97.0	97.9	97.9	92.5
61°-65°	176	90.5	91.9	91.9	93.0	91.9	93.5	94.0
66°-70°	238	90.2	89.3	90.9	91.4	91.8	92.3	89.8
71°-75°	206	91.2	90.5	90.4	91.6	91.9	92.4	89.6
76°-80°	147	97.2	94.7	94.3	93.0	92.1	94.0	90.1
81°-85°	48	115.6	114.4	107.4	95.6	96.1	107.7	96.0
Over 85°	8	136.1	140.0	99.7	110.2	113.0	113.1	95.8

Mean daily temperature.	Number of days. <sup>1</sup>	Mortality in per cent of daily average for year in which temperature occurred.						
		Days after.						
		7	8	9	10	11	12	13
Under 5°	5	113.0	113.0	117.5	96.5	110.2	103.9	96.5
6°-10°	15	101.1	110.0	105.6	118.1	99.7	104.6	104.6
11°-15°	39	107.2	106.8	106.0	107.4	108.2	109.5	110.2
16°-20°	71	107.7	107.0	109.8	109.3	110.9	107.7	110.7
21°-25°	89	107.7	105.6	107.5	109.6	105.1	109.6	108.1
26°-30°	130	106.5	108.2	107.7	107.2	108.2	109.5	107.9
31°-35°	181	107.7	108.2	107.2	108.7	108.1	106.7	107.0
36°-40°	189	106.3	106.0	106.3	104.4	107.2	106.3	107.9
41°-45°	154	108.4	107.5	108.1	108.6	108.8	104.7	105.4
46°-50°	153	99.3	101.1	101.1	102.6	100.4	101.6	102.3
51°-55°	151	101.1	99.3	101.6	99.6	101.6	102.6	100.2
56°-60°	170	98.6	97.6	98.8	95.1	97.0	96.3	85.6
61°-65°	176	93.9	93.9	92.3	93.7	91.9	92.3	91.7
66°-70°	238	93.3	93.0	92.6	90.4	91.6	93.5	93.0
71°-75°	206	91.6	91.9	93.0	93.7	94.1	92.0	93.5
76°-80°	147	91.6	91.9	91.6	91.4	91.0	90.7	92.3
81°-85°	48	90.3	89.4	89.1	94.6	92.6	92.6	90.9
Over 85°	8	96.5	111.1	120.8	92.8	90.2	101.8	96.3

<sup>1</sup> Total days, 2,170.

During the years in question, the deaths at times of high or low temperature were 10.2 per cent higher than the deaths at temperatures of 60° to 70°. Similar conditions prevail to-day. If the death rate all the time were as low as it is when the temperature averages about 65°, one death out of every ten might be prevented. Low temperature, to judge from the table produces about seven times as much ill effect as high, for normally there are about seven days with a temperature below 60° for every day above 75°. It is not correct, however, to speak as if low temperatures alone were the cause of the deaths. Low temperature in itself is probably the cause of very few deaths. The effects often attributed to the cold may be due in many instances to improper indoor conditions. In fact, it is not improbable that the benefit derived from the stimulus of going into the cold outdoor air in winter is greater than the harm due to chills. Nevertheless, the fact remains that in New York City during the years under discussion the death rate during the coldest days of winter was more than 20 per cent greater than in days when the temperature was about 65°.

What all this seems to mean is that we know how to guard against low temperature by means of clothing, houses, fire, and exercise, and that in a civilized community it is very rarely necessary that anyone should come to much harm from low temperature in itself. On the other hand, we have not learned to guard against the harmful conditions which we ourselves produce in our attempts to ward off the cold. The graph \* \* \* affords a suggestion of what happens when we light our fires. Notice the steepness of the curve between 60° and 40°. These are the temperatures when we begin to have fires in our houses. The steepness of the curve seems to mean that as soon as we start our fires we create conditions which promote bad health and as soon as we let them out in the spring we remove those conditions. It may be that a large part of the excess death rate in cold weather is preventable.

The committee on the atmosphere and man is working on the problem of all the conditions which raise the death rate at temperatures above or below the narrow ideal limits. It is not to be expected that the curves in the graph can ever be converted into straight lines. It is to be expected, however, that the high parts below 60° and above 75° can be greatly lowered.

The foregoing is a first study of a few of the facts available in the records of the committee. Further inquiries are being made into the effect of relative humidity and of interdiurnal change in temperature. It is hoped also to have net correlation studies prepared when all of the necessary crude tabulations are completed.

## THE DROUGHT IN ITALY DURING 1921.

By FILIPPO EREDIA.

[Abstracted from *Comptes Rendus*, February 5, 1923, pp. 402-404.]

The normal course of annual precipitation in the southern portion of Italy and in the islands is a maximum in winter and a minimum in summer; in the northern portion, two maxima, one in spring and the other in autumn, and two minima, one in summer and the other in winter.

During the year 1921, the annual march was wholly abnormal. There was but slight fall of snow in January and February, abundant rain in spring, and excess of rain in summer, and a remarkable deficiency beginning in September and continuing to the end of the year.

Most Italian droughts have been associated with the apparent joining of the Siberian and Atlantic high pressure areas across Europe. When this occurs, the Atlantic depressions pass farther to the north, and only occasionally may secondaries develop in the Mediterranean, producing rain in the central and southern parts of Italy. In the present case, the northern portion received almost no rain because the few depressions which did appear on the coast of northern Africa were prevented from producing precipitation in northern Italy by the high pressure above mentioned. They did produce some rain in the southern part, however.

The author believes that, in addition to the high pressure belt across Europe, unusually low pressure in the

eastern Mediterranean was a contributing factor to the drought of 1921.

The intensity of this drought may be estimated from the comparison of rainfall records at Padua and Milan, which are the longest available. A study of these records shows that periods when the rainfall was less than one-third of the normal always occurred in winter, but never with the intensity shown in the months of October to December. The two longest periods in which no rain fell occurred in 1854, from January 13 to April 19, and in 1878, from January 1 to March 22. But never before has such a drought occurred in the early months of winter.—C. L. M.

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C. F. TALMAN, Meteorologist in Charge of Library.

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